

**NORTH CAROLINA DIVISION OF
AIR QUALITY**

Air Permit Review

Permit Issue Date:

Region: Raleigh Regional Office
County: Vance
NC Facility ID: 9100069
Inspector's Name: Will Wike
Date of Last Inspection: 07/19/2016
Compliance Code: 3 / Compliance - inspection

Facility Data

Applicant (Facility's Name): Ardagh Glass Inc.

Facility Address:

Ardagh Glass Inc.
 620 Facet Road
 Henderson, NC 27537

SIC: 3221 / Glass Containers

NAICS: 327213 / Glass Container Manufacturing

Facility Classification: Before: Title V **After:** Title V

Fee Classification: Before: Title V **After:** Title V

Permit Applicability (this application only)

SIP:
NSPS:
NESHAP:
PSD:
PSD Avoidance:
NC Toxics:
112(r):
Other:

Contact Data

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Application Data

Application Number: 9100069.16A
Date Received: 08/01/2016
Application Type: Modification
Application Schedule: TV-Significant
Existing Permit Data
Existing Permit Number: 02834/T25
Existing Permit Issue Date: 07/12/2016
Existing Permit Expiration Date: 04/30/2018

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2015	157.05	456.39	20.14	72.77	52.07	3.31	1.70 [Hydrogen chloride (hydrochlori)]
2014	143.73	516.54	19.86	72.36	54.23	3.61	2.02 [Hydrogen chloride (hydrochlori)]
2013	150.68	515.35	19.82	72.32	52.38	3.08	1.54 [Hydrogen chloride (hydrochlori)]
2012	152.32	515.72	18.38	65.90	60.80	2.66	1.26 [Hydrogen chloride (hydrochlori)]
2011	117.11	636.24	19.42	58.53	79.94	3.49	1.83 [Hydrogen chloride (hydrochlori)]

Review Engineer: Joseph Voelker

Review Engineer's Signature:

Date:

Comments / Recommendations:

Issue 02834/T26

Permit Issue Date:

Permit Expiration Date:

I. Introduction and Purpose of Application

Ardagh Glass Inc. (AGI) owns and operates a glass container production facility located in Henderson, North Carolina. AGI would like to address the following:

As stated in the permit application:

A Global Consent Decree (GCD) was finalized for Saint-Gobain Containers, Inc. (now AGI) by the Federal District Court with a Date of Entry (DOE) of May 7, 2010. Per the GCD (IV.7.b.i.2), the Henderson Plant is required to convert the Henderson Furnace #1 (part of GF-1) to an oxyfuel furnace by December 31, 2016 to achieve a NOx emission rate of 1.3 lb/ton of glass produced. Following an approval from the Environmental Protection Agency (EPA) on June 25, 2015, AGI submitted a preconstruction permit application in July 2015 for installation of an alternative control device technology in lieu of the GCD-specified oxyfuel for Henderson's Furnace #1. A preconstruction permit dated March 17, 2016 (Permit No. 02834T24) was issued by NC DEQ to begin construction of the control device.

This application is being submitted to modify the facility's Title V permit to account for the installation of a McGill AirClean™ advanced selective catalytic reduction (SCR) system. The SCR system includes a ceramic filter technology (TopFrax™) with upstream injection of ammonia to control NOx emissions and PM emissions.

Given the proposed changes to the existing Title V (TV) permit, this application will be processed as a significant modification pursuant to 15A NCAC 02Q .0516 SIGNIFICANT PERMIT MODIFICATION.

II. Chronology

(Only critical path related events are presented)

Date	Description
07/22/2015	Modification application was received, assigned app. No. 9100069.15A and deemed complete via acknowledgement letter
12/28/2015	A routine maintenance and repair (RMRR) applicability determined was made by the DAQ concerning a furnace maintenance and repair project to furnace GF-1. The DAQ concurred with the Permittee that the project was not a major modification for PSD or NSPS purposes and that no permit modification application was necessary.
03/17/2016	Permit No. T24 issued in response to application no. 9100069.15A. The permit contained the following requirement at 2.1 A.6.: <i>State Enforceable Only</i> <i>Pursuant to NCGS 143-215.108(c), the Permittee shall submit a permit application prior to the operation of the furnace (ID No. GF-1) after the installation of the control device (ID No. CD-1) if the Permittee cannot meet the requirements set forth in the permit no. 02834T24.</i>
08/01/2016	Modification application was received, assigned app. No. 9100069.16A and deemed complete via acknowledgement letter

Date	Description
08/26/2016	<p>ADD INFO email was sent requesting the following:</p> <ol style="list-style-type: none"> 1. PSD - Please supply a description of the project that clarifies that the increase in throughput ("mod 1") and the installation of the control device ("mod 2") are not related. 2. PSD - I agree that the increase in throughput is not a modification under PSD. However, the installation of the control device and appurtenant equipment is ("mod 2"). Please supply emissions estimates for all pollutants that are increasing as a result of "mod 2". 3. 02D .1100 toxics - Since you are relocating your GF-1 stack, the exiting modeling demonstration may no longer be valid. I attached the review for the existing modeling demonstration. Since it was optimized a dispersion parameter/ location comparison between existing and proposed emission points may all that is needed. Please provide, the relevant dispersion parameters and location for the existing stack and proposed stack. 4. 02D .0521 - To confirm, does Ardagh intend to dismantle the COMs on GF-1? If not, we would need to keep COMs for monitoring, recordkeeping and reporting on 02D .0521. 5. 02D .0521 - Please provide the maximum opacity reading for each checker cleaning since the issuance of T19. I thought I could get all the information via the reporting requirements but the way the COMs reporting requirement is structured we do not have the data. I can only get the checker cleaning info not the opacity.
08/30/2016	<p>An ADD INFO email was sent requesting the following:</p> <p><i>Could you please elaborate on the dust handling system. It is described in section 1.3 of the Scope of Work but it is unclear to me how it will be employed and if it is an emission source. For example, the material is pneumatically conveyed from the gather-up conveyor to the supersack collector or a silo. Is the supersack station another collection device with a bag filter that vents to the atmosphere? Will the collected material be recycled back into the process?</i></p>
08/31/2016	An email from the Permittee was received in response to the ADD INFO email sent on 08/30/2016. Mr. Metzger confirmed that the catalytic filter dust handling system was not represented properly in the application. The system will be located indoors and per DAQ policy it is assumed to not emit PM to the environment. It will appear in the insignificant activities list as IS-DLO.
09/18/2016	An email from the Permittee was received in response to the ADD INFO email sent on 08/26/2016. The response will be discussed as necessary in Section III and IV below.
09/21/2016	Preliminary draft permit submitted to the Permittee for review.
10/03/2016	Preliminary draft comments received by the Permittee
10/18/2016	Second draft permit submitted to the Permittee for review.
10/28/2016	Final preliminary draft comments received by the Permittee
MM/DD/YYYY	Draft permit published on NCDENR website for concurrent public and EPA review pursuant to TV permitting requirements.
MM/DD/YYYY	Public comment period ended. No comments received.

III. Modification Discussion

On 03/17/2016, permit No. T24 was issued that allowed the construction of the control device (ID No. CD-1) for purposes of compliance with the GCD referenced in Section I above. The permit contained the following condition:

State Enforceable Only

Pursuant to NCGS 143-215.108(c), the Permittee shall submit a permit application prior to the operation of the furnace (ID No. GF-1) after the installation of the control device (ID No. CD-1) if the Permittee cannot meet the requirements set forth in the permit no. 02834T24.

At that time the Permittee did not have enough information on the control device to revise the existing monitoring, recordkeeping and reporting in permit no. T23. To avoid waiting and running into a potential construction timing issue, permit no. T24 was issued that effectively allowed construction of the device but not claim any benefit it could provide with respect to (primarily) PM control. The Permittee had no intention in operating the furnace as it was configured in T24 although it could have done so.

The current application includes the necessary information to revise the monitoring, recordkeeping and reporting for all applicable regulations for which the control device will have an effect.

The Permittee also wishes to increase the permitted production capacity of the furnace GF-1 from a “nominal 320 tons per day” as provided in the permit to a “peak pull rate of 350 tons per day”. The Permittee claims that no physical modification is necessary to make this change to the furnace. Note that there are no permit enforceable restrictions in the existing permit (T25) that would forbid the facility from simply increasing production.

Mc Gill AirClean advanced SCR system

The facility proposes to install a McGill AirClean™ advanced SCR system, comprising of a TopFrax™ catalytic filter system, a catalytic filter dust handling system, and aqueous ammonia feed system, to control NOx and PM emissions from Furnace #1. The NOx control device is designed to achieve the GCD-specified NOx emission limit of 1.3 lb/ton glass pulled. In addition, the installation of the control device will lead to a decrease in PM emissions on a lb/ton basis.

The existing permit describes the furnace and control device as follows:

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
GF-1 NSPS GACTION SSSSSS	<p>Glass melting furnace including the following equipment:</p> <p>(i) one natural gas/propane-fired melter with electric boost (320 tons per day nominal rated glass pull rate, 55 million Btu per hour nominal heat input capacity when firing natural gas, and 3600 kva electric [12.3 million Btu per hour] maximum heat input capacity).</p> <p>(ii) one natural gas/propane-fired distributor (12.45 million Btu per hour maximum heat input capacity).</p> <p>(iii) two natural gas/propane-fired forehearths (5.0 million Btu per hour combined total maximum heat input capacity).</p>	CD-1	Filtration system consisting of ceramic filter media with embedded catalyst for NOx control only

It will be revised to read as follows:

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
GF-1 NSPS GACT SSSSSS	<p>Glass melting furnace including the following equipment:</p> <p>(i) one natural gas/propane-fired melter with electric boost (350 tons per day rated glass pull rate, 60 million Btu per hour maximum heat input capacity, and 3600 kVA electric [12.3 million Btu per hour] maximum heat input capacity).</p> <p>(ii) one natural gas/propane-fired distributor (12.45 million Btu per hour maximum heat input capacity).</p> <p>(iii) two natural gas/propane-fired forehearths (5.0 million Btu per hour combined total maximum heat input capacity).</p>	CD-1	Filtration system consisting of ceramic filter media with embedded catalyst for NOx and PM control

The various aspects of the control system will consist of the following:

- Catalytic filter modules – including hopper and housing support structures
- Catalytic filter dust handling system – including screw conveyors pneumatic dust transport system and super sack collection
- Dust storage - including dust silo, dust discharge feed/weighing system, and diverter valve for super sack collection. *(Note this description is from the application but via email the Permittee stated that this is not how it is to be constructed; it will simply be a pneumatic bag loading operation that is located indoors).*
- Aqueous ammonia feed system components for NOx removal including -
 - Storage tank with fill station, instrumentation, pressure relief, leak detector, and drain connection.
 - Ammonia feed system with redundant pump skid with leak detector, spray lance, static mixer, and safety showers. Also includes enclosure for ammonia pumps.
- Manufactured flue gas ductwork system - including typical components which also include a flue gas heating system burner with gas train, combustion air blower, and controls to maintain flue gas temperature by heating. *(Note: Burner location near system off-take in duct.)*
- Electrical equipment and control system

The following narrative from the application provides an excellent description of the control system components.

- 1 System inlet duct: The flue gas, under negative pressure, exits the furnace and enters the inlet duct for conveyance to the catalytic filter. The inlet duct includes both a duct burner system and water cooling lance to maintain a constant temperature range at the ceramic filter inlet. The burner maximum required heat input is 2.5 MMBTU/hr during low off-take temperature conditions. The water cooling lance provides a maximum of 10 gpm of cooling water during high off-take temperature conditions. The duct also includes test ports.
- 2 Aqueous ammonia storage and injection system: The 19% aqueous ammonia is stored in a 10,000 gallon ASME code storage tank near the catalytic filter. Tank includes a truck fill station, spill containment, leak detection, level detection, and temperature and pressure monitoring. Redundant pumps are provided to deliver the ammonia to an atomizing lance located in the system inlet duct. The ammonia injection rate is controlled by feedback from the continuous emissions monitoring system located in the exhaust stack. The ammonia rapidly evaporates and mixes with the flue gas as it carried to the catalytic filter for NOx reduction. Ammonia leak detection is also provided near the lance location. Safety showers are provided at the tank and lance locations.
- 3 Catalytic filter system: The catalytic filter unit is comprised of four modules; each module contains 256 catalytic filters each. The flue gas enters an inlet manifold which directs the gas into each of the four modules to pass through the catalytic filters. The filters serve two purposes; they collect solid particulate matter, and contain catalyst for the reduction of NOx. As the flue gas passes through the filter particulate is captured on the outside of the filter. The particulate is periodically cleaned off the filters with a pulse air cleaning

system which dislodges the dust from the outside of the filter. The dust falls off the filters into collection hoppers, it is then conveyed to a bulk bag storage system. The ammonia, that was injected into flue gas, now reacts with the NO_x in the presence of the catalyst in the filter ($\text{NH}_3 + \text{NO}_x = \text{N}_2 + \text{H}_2\text{O}$) to form inert nitrogen (N₂) and water vapor (H₂O). The clean flue gas exits each module into an outlet manifold which conveys the flue gas to the fans. The Catalytic filter includes a bypass manifold which allows the flue gas to bypass the catalytic filter modules allowing for periodic maintenance of the system. Also, each filter module includes inlet and outlet isolation valves for single module isolation permitting maintenance on a single module while the other modules continue to operate. The system is sized for this condition.

- 4 Exhaust stack: Redundant induced draft fans exhaust the flue gas to atmosphere through the 130 foot tall stack. The stack includes a platform with stairway access, test ports, and continuous emissions monitoring equipment.

IV. Regulatory Review

15A NCAC 02D .0515: PARTICULATES FROM MISCELLANEOUS INDUSTRIAL PROCESSES

The furnace is currently uncontrolled and the permit currently requires an annual PM source test, and monitoring associated primarily addressing the checker cleaning operation. Checker cleaning usually results in higher opacity (see 02D .0521 discussion below) and higher short term emissions of PM. This source has a documented violation of 02D .0515 based on a source test of the checker cleaning event of 09/25/2012. The facility subsequently retested during the checker cleaning event on 06/18-19/2013 and demonstrated compliance with 02D .0515. The time elapsed between these 2 checker cleaning vents was 265 days. Thus, as presented in the permit, the Permittee can do subsequent checker cleanings without additional source testing as long as the time between checker cleaning events is less than or equal to 265 days. A review of the records show that this is the case.

The Permittee is now requesting to install and operate the control system. The Permittee has vendor guarantees that filterable PM emissions will not exceed 0.2 lb/ton (the now-applicable NSPS Subpart CC filterable PM emission limitation and the alternate MACT SSSSSS PM emission limitation) and 0.45 lb/ton total PM even though the most stringent applicable total PM emission limitation is 1 lb/ton via the Global Consent Decree (section 2.3.IV.9.f. of the current permit).

For process rates up to 30 tons per hour, the allowable total PM emission rate is $E = 4.10 \times P^{0.67}$

Where E = allowable emissions rate in pounds per hour

P = process weight in tons per hour

Liquid and gaseous fuels and combustion air are not considered as part of the process weight. Based on the new maximum (peak) production rate of 350 tons per day an estimated hourly maximum production rate is equal to 14.58 tph (i.e., 350 tpd / 24 hr/day). Assuming this was equal to the process rate the allowable PM emission rate is 24.7 lb/hr. Note that the process rate (i.e., rate of raw material usage) is always greater than the production rate hence the allowable emissions will actually be greater than 24.7 lb/hr at maximum production rate. This rate is equivalent to 1.69 lbs of PM per ton of glass produced (i.e., $24.7 \text{ lb/hr} \times 24 \text{ hr/day} / 350 \text{ ton glass produced/day}$). The facility has demonstrated compliance with the 1 lb/ton total PM emission limitation since it was applicable as December 31, 2014 and will continue to do so via an annual source test requirement. The most recent PM source tests are included in the table below (excerpted from the compliance inspection report of 07/19/2016 by Will Wike). All tests demonstrated compliance with the applicable regulations except as noted.

Date	Furnace No.	Pollutant(s)
5/6-8/15	GF-1,2	PM and H ₂ SO ₄
5/20-23/14	GF-1,2	PM and H ₂ SO ₄
7/18/13	GF-1	PM and H ₂ SO ₄
6/18-19/13	GF-1	PM (checker cleaning – passed)
5/7-9/13	GF-1,2	PM and H ₂ SO ₄
9/25/12	GF-1	PM (checker cleaning – failed)
8/15/12	GF-2	PM, Fl, Pb, and H ₂ SO ₄

Date	Furnace No.	Pollutant(s)
4/27/11	GF-2	PM and NO _x
4/26/11	GF-1	PM, CO, NO _x , SO ₂ , and H ₂ SO ₄
8/31/10	GF-2	PM, NO _x , and H ₂ SO ₄
5/6/10	GF-1	PM
10/28/09	GF-1	Chromium
9/15/09	GF-2	PM
4/23/09	GF-1	PM

Although it is expected that the PM controls will reduce PM emissions during any checker cleaning operation, the source testing record does suggest the level of PM emissions is dependent on periods between checker cleaning. Additionally, the facility would still like to maintain the 40% opacity limit under 02D .0521 during checker cleaning. This supports the idea that opacity and PM emissions may increase during the checker cleaning operation even with the PM control system in operation. In the absence of any other information, the existing monitoring, recordkeeping and reporting associated with the checker cleaning will remain in the revised air permit.

15A NCAC 02D .0516: SULFUR DIOXIDE EMISSIONS FROM COMBUSTION SOURCES

This control device will be used for NO_x and PM control and is not expected to have any impact on SO₂ emissions. SO₂ emissions from this source are the result of sulfur contained in the fuels and raw materials. This rule allows a maximum of 2.3 lb/MMBtu SO₂ emissions. This includes SO₂ emissions originating from sulfur containing batch materials.

The Permittee is subject to GCD imposed SO₂ emission limits ranging from 2.0 (clear glass) to 2.4 (colored glass) lbs SO₂/ton of glass produced, 30-day rolling average as found at condition 2.2A.2. in the current permit. The Permittee uses SO₂ CEMS to demonstrate compliance. Given the maximum heat input into the furnace (melter, distributor and forehearth) is 84.75 MMBtu/hr and the maximum hourly production (from a practical standpoint) is 14.58 tons per hour (350 tons per day / 24 hr/day), these limits equate to 0.34 to 0.41 lb/MMBtu, an order of magnitude less than the 02D .0516 standard. Thus compliance with the GCD limits will ensure compliance with 02D .0516 by a very wide margin.

No substantive changes will be made to the existing permit conditions which require no monitoring, recordkeeping or reporting.

15A NCAC 02D .0521: CONTROL OF VISIBLE EMISSIONS

The current permit has the following opacity limitations:

- a. Visible emissions from the glass-melting furnace (distributor and forehearth only, ID No. GF-1) shall not be more than **20 percent opacity** when averaged over a six-minute period.
- b. Visible emissions from the melter of the glass-melting furnace (ID No. GF-1) shall not be more than:
 - i. 20 percent opacity when averaged over a six-minute period, except during checker cleaning events; or
 - ii. 40 percent opacity when averaged over a six-minute period, during checker cleaning events.

No monitoring, recordkeeping and reporting is required for the distributors and forehearth and this will remain unchanged in the revised permit.

The melter, because it currently uses COMs for NSPS subpart CC compliance is also required to demonstrate compliance with these opacity standards with the use of COMs. With this modification, the Permittee is constructing a control system for PM and NO_x and a new stack as well. As the use of COMs will no longer be required for NSPS compliance, the Permittee is requesting its use for compliance with 02D .0521 be removed from the permit. The Permittee confirmed that it also wishes to remove the COMs system entirely from operation. Consistent with DAQ policy, since the use of the COMs is no longer required (in this case by NSPS) and will be dismantled (and hence cannot provide opacity data) its use for 02D .0521 compliance purposes may also be rescinded.

In the absence of COMs, the standard monitoring, recordkeeping and reporting required is using visible emission (VE) observations. Consistent with other glass furnaces not utilizing COMs, VE readings will be required once per week with associated recordkeeping and reporting.

Note that NSPS Subpart CC allows the furnace to operate for periods of time (up to 6 days per year) without control for maintenance. The application also states that the source is capable of operating with the control device being bypassed. The Permittee will be required to take VE readings during these time periods.

With respect to the current 40% opacity limit, the Permittee has not requested to restore the 20% opacity limit that applied to the furnace under all operating scenarios until permit no. T19. It obtained a 40% limit by demonstrating that no NAAQS or PM emission standard violations would occur. Since the Permittee wishes to maintain the 40% opacity limit during checker cleaning, VE readings for each checker cleaning event will be required with the associated recordkeeping and reporting.

15A NCAC 02D .0524: NEW SOURCE PERFORMANCE STANDARDS (40 CFR PART 60 SUBPART CC-STANDARDS OF PERFORMANCE FOR GLASS MANUFACTURING PLANTS)

In its current configuration, the furnace is subject to a filterable PM emission standard of 1 lb/ton pursuant to 40 CFR 60.293 “Standards for particulate matter from glass melting furnace with modified-processes.” As such, the use of COMs is required for monitoring purposes.

Upon installation of the PM control device, and pursuant to 40 CF 60.292 “Standards for particulate matter” the furnace will be subject to a filterable PM emission standard of 0.2 lb/ton, corresponding to the emissions standard applicable to furnaces producing container glass. The rule requires testing, monitoring and recordkeeping mainly pursuant to 40 CFR 60 Subpart A for “the occurrence and duration of any startup, shutdown, or malfunction in the operation of an affected facility; any malfunction of the air pollution control equipment; or any periods during which a continuous monitoring system or monitoring device is inoperative”. Additional recordkeeping requirements pursuant to 15A NCAC 02Q.0508(f) will be included that are typical for sources utilizing filtration control devices to make the permit practically enforceable.

The rule allows at 60.292(e):

During routine maintenance of add-on pollution controls, an owner or operator of a glass melting furnace subject to the provisions of paragraph (a) of this section is exempt from the provisions of paragraph (a) of this section if:

- (1) Routine maintenance in each calendar year does not exceed 6 days;*
- (2) Routine maintenance is conducted in a manner consistent with good air pollution control practices for minimizing emissions; and*
- (3) A report is submitted to the Administrator 10 days before the start of the routine maintenance (if 10 days cannot be provided, the report must be submitted as soon as practicable) and the report contains an explanation of the schedule of the maintenance.*

Because COMs is not required under the rule when complying with the emission standards at 60.292, the Permittee has requested to remove the use of COMs for NSPS purposes. The permit condition will be substantially revised to remove any COMs requirements under NSPS. See the Table of Changes section of this review for a list of all changes made to the existing permit condition.

15A NCAC 02D .1111: MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY

This condition addresses 40 CFR 63, SUBPART SSSSSS “National Emission Standards for Hazardous Air Pollutants for Glass Manufacturing Area Sources.” The current permit requires compliance with the following emission standard.

The 3-hour block average production-based metal HAP mass emission rate must not exceed 0.01 g/kg (0.02 lb/ton) of glass produced.

The Permittee had requested this at the time the permit condition was placed into the permit. At that time the furnace was uncontrolled and the Permittee was not sure it could comply with the surrogate emission limitation of

The 3-hour block average production-based PM mass emission rate must not exceed 0.1 gram per kilogram (g/kg) (0.2 pound per ton (lb/ton)) of glass produced.

Note that this PM emission limit is the same as that now required by NSPS Subpart CC. It is expected then that the facility would be able to comply with the surrogate PM standard if it chooses to do so. The Permittee has already met the emissions testing requirement and because the current modification is not expected to result in any formulation changes that by extension would suggest the existing source test is no longer valid, no additional testing will be required for simply adding the control device.

Under the MACT, sources using control devices to meet the emission limitations have monitoring, recordkeeping and reporting associated with those control devices. Because the facility has not requested to utilize a control device to demonstrate compliance with the emission standard nor comply with the alternative PM standard, no changes will be made to the existing emission limitation or monitoring, recordkeeping and reporting. However, in the future, if the Permittee wishes to demonstrate compliance with the MACT standard, unless the Permittee tests during a control device bypass scenario, the results of the test will show the effect of the control system now in place and hence the monitoring, recordkeeping and reporting will have to be revised. The permit condition will be annotated to make sure that this scenario is acknowledged.

Global Consent Decree (GCD)

The current permit contains all the emissions limitations-relevant requirements at Section 2.3. as the result of the Consent Decree in the matter of *United States v. Saint-Gobain Containers, Inc.* (Civil Action No. 2:10-cv-00121-TSZ) relating to alleged violations of the Clean Air Act.

Section IV. 7. b. of the GCD requires Henderson Furnace No. 1 to implement SCR (instead of the originally required Oxyfuel Technology) as approved via letter from the EPA dated June 25, 2015. The construction of this control technology (CD-1) was addressed in permit no T24 issued 03/17/2016. This current permit application addresses the requirements of operating the control device with respect to its effect on controlling PM in addition to NOx (i.e., revised regulatory applicability and monitoring, recordkeeping and reporting as discussed previously).

The current application is also requesting an increase in the permitted production rate from a nominal 320 tons per day to a 350 tons per day, peak. This change in throughput has implications with respect to the NOx and SO2 limits required under the GCD. The implications with respect to SO2 will be discussed separately.

NOx

For furnace GF-1, Section IV.d.ii.1. of the GCD requires

“1.3 pounds of NOx per ton of glass produced on a 30-day rolling average, as measured using a NOx CEMS (where available), except during the following periods (as set forth in this Subparagraph): Abnormally Low Production Rate Days for any of the Furnaces; Control Device Startup; up to the first seven (7) days of the Furnace Startup; Malfunction of the SCR; and Maintenance of the SCR”.

Sections IV.d.ii.2 through 4 addresses these exception days to the 30-day rolling average. These exception limits are variable and are presented in the form of equations, and depend among other things on the parameter “Abnormally Low Production Rate Day Threshold” [ALPRDT]. This parameter is defined in the GCD as 35% of the permitted production rate. The current GCD reflects 112 tpd which is 35% of the current permitted 320 tpd throughput. This value will be revised to 123 tpd (i.e., 0.35×350 tpd). Consistent with prior permitting practice, this value will be revised in Section 2.3 and indicated as such in italics.

The existing GCD language contains all the applicable monitoring, recordkeeping and reporting associated with these NOx limits. Other than the revision of the ALPRDT value no other changes are necessary to the permit with respect to the GCD imposed NOx emission limitations.

SO2

Similar to NOx, the exception days for the SO2 emission limit are a function of the ALPRDT. In permit No. T25, most of the SO2 emission limitations in the GCD were relocated to Section 2.2.A.2 as a result of GCD language that required a permitting action with respect to the SO2 emission limitations. At that time, the equations were simplified and incorporated the ALPRDT at the request of the Permittee. With the revision of the maximum production rate, most of the equations of Section 2.2.A.2 will need to be revised to incorporate the revised ALPRDT value 123 tpd. Section 2.2.A.2 will be revised accordingly. See Section VII. Table of Changes for a list of all changes made.

V. Facility Compliance Status

During the most recent inspection, conducted on 07/19/2016 by Mr. Will Wike of the Raleigh Regional Office (RRO), the facility appeared to be in compliance with all applicable requirements.

VI. NSPS, NESHAP, PSD, CAM, State Toxics Applicability

NSPS

This modification only impacts Furnace No. 1 which is subject to NSPS Subpart CC. See Section IV for full discussion.

NESHAP

This modification only impacts Furnace No. 1 which is subject to 40 CFR 63, SUBPART SSSSSS “National Emission Standards for Hazardous Air Pollutants for Glass Manufacturing Area Sources. See Section IV for full discussion.

PSD

This modification consists of two changes to the operations of the glass furnace GF-1;

- i. the increase in production rate; and
- ii the installation of the control system

Increase in production rate

The Permittee has stated and confirmed via email that no physical modifications are necessary to increase the throughput of the furnace. The installation of the control system is not a necessary physical modification to increase production at the facility. Although the furnace is described in Section 1 of the permit as having a 320 tons per day nominal rated glass pull rate it is not a “federally enforceable permit condition which was established after January 6, 1975, pursuant to 40 CFR 52.21 or under regulations approved pursuant to 40 CFR subpart I or §51.166.”

Pursuant to 40 §CFR 51.166 (b)(2)(iii)(f),

- (iii) A physical change or change in the method of operation shall not include:*
- (f) An increase in the hours of operation or in the production rate, unless such change would be prohibited under any federally enforceable permit condition which was established after January 6, 1975, pursuant to 40 CFR 52.21 or under regulations approved pursuant to 40 CFR subpart I or §51.166.*

Since the increase in “permitted” throughput does not require a physical change or change in the method of operation, it is not considered a modification for PSD purposes.

Installation of control system

The control system is designed to reduce PM and NOx emissions from the melter which can be best described as a reduction on a pound of pollutant per ton of glass produced basis. The control system however requires the injection of ammonia upstream of the catalytic filter for reduction of NOx. The inlet duct will include a duct burner system and a water cooling lance to maintain a constant temperature range at the ceramic filter inlet. The burner maximum

required heat input is 2.5 MMBTU/hr during low off-take temperature conditions. The water cooling lance provides a maximum of 10 gallons per minute (gpm) of cooling water during high off-take temperature conditions.

Pursuant to 15A NCAC 02.0530 PREVENTION OF SIGNIFICANT DETERIORATION at (b)(4)

(4) significant levels in 40 CFR 51.166(b)(23)(i) are incorporated by reference except as otherwise provided in this Rule. Sulfur dioxide (SO₂) and nitrogen oxides (NO_x) are not precursors to PM in all attainment and unclassifiable areas. Volatile organic compounds and ammonia are not significant precursors to PM_{2.5}.

Hence in NC, ammonia is not a regulated PSD pollutant. The Permittee supplied emission estimates for all pollutants related to the installation of the control system (i.e., natural gas fired duct heater). All estimates are well below the applicable PSD significance thresholds. In summary, PSD review does not apply to the modification associated with the installation of the control system as represented in this application.

CAM

The control device is being used to control PM and NO_x. After control emission estimates at a maximum operation rate result in emissions less than 100 tpy each. As such the source is **not** a large pollutant-specific emissions unit (PSEU) for either pollutant. Pursuant to 40 CFR 64.5 “Deadlines for submittals” at (b), the Permittee is not required to address CAM until the next TV permit renewal.

State Toxics (15A NCAC 02Q.0700 and 02D. 1100) [State only requirement]

At Section 2.1.A.7 the Permittee is required to submit an application to comply with 02D .1100 if the modification results in an increase in ammonia over the TPER. The Permittee supplied an emissions estimate based on an ammonia slip concentration of 10 ppmw (vendor guarantee to be verified via source testing). The potential facility-wide emissions are expected to be below the TPER. Note that the TPER would be exceeded at a slip of 13 ppmw. This condition will remain in the permit pursuant to current policy.

This source is subject to MACT SSSSSS and as such is exempt from the state toxics permitting program (when it is subject to MACT) as long as no unacceptable risk would be posed for doing so. Emissions increases associated with this modification are associated with the use of the new natural gas-fired 2.5 MMBtu/hr duct burner and the increase in production from 320 tpd nominal production rate to a 350 tpd peak production rate. The TAP emissions associated with the burner are minor compared to the overall TAP emissions from the overall furnace. Based on combustion considerations alone the furnace has TAP emissions associated with a combined heat input of 72.45 MMBtu/hr. Thus, on a potential basis, the increase of TAP emissions from combustion are estimated to be 3.5% (i.e., 2.5/72.45*100). TAP emissions associated with the increase in permitted capacity is 9.4% (i.e., (350-320)/320*100). Thus, the PTE for TAPs are expected to increase by approximately 13%.

The TAP emission limitations in the current permit were first included in permit no. T15 (2004). Upon review of that modeling demonstration conducted in 2004, these rates were “optimized to 100% of the applicable AAL. Below is a table for Furnace No. 1 (GF-1) comparing the potential emissions of each TAP at the requested production rate (excerpted from the current application) and its associated TAP emission limit in the current permit:

Source	Toxic Air Pollutants	Emission Limit	PTE, from application	Applicable Averaging Period
Glass Melt Furnace (ID No. GF-1)	arsenic	113.2	21.11	lb/yr
	cadmium	2706.5	11.41	lb/yr
	sulfuric acid	80	4.38	lb/hr
	sulfuric acid	989.3	105.00	lb/24-hr
	fluoride	200	0.15	lb/hr
	fluoride	1319.1	3.68	lb/24-hr

In all cases, the TAPs were optimized by at least an order of magnitude in the 2004 modeling. Also note that the arsenic AAL has been revised upward by approximately a factor of 9 since this demonstration was conducted. Therefore, if the modeling demonstration was repeated using the new AAL, the optimized arsenic emission rate would be even greater, hence an even greater difference between the expected maximum emissions and emissions that would potentially result in ambient impacts approaching the AAL. Clearly, TAP emissions after this modification are not expected to come close to the permitted TAP emission limits.

However, this project will result in a change in the dispersion parameters relative to those used in the 2004 analysis. Although, the stack height, diameter, flow and temperature are not expected to change appreciably, the stack will be located approximately 190 feet away from the current location away from the building enclosing the furnace. Tom Anderson, Supervisor of the Air Quality Analysis Branch (AQAB) stated that based on his experience, locating the stack further away from the structure that could affect downwash would not result in increases in ambient impacts but more likely change the location of those impacts. Given this statement and the fact that the source will emit TAPs on an actual and potential basis much less than those included in the 2004 analysis it is highly unlikely this modification would result in the exceedance of any AAL. Based on this analysis, no new modeling analysis will be required. The emission limits as presented in the current permit will remain in the revised permit.

VII. Changes to the existing permit

Existing Condition No.	New Condition No.	Changes
Cover Letter	Same	Revised dates, permit numbers, etc. using current shell standards
Insignificant Activities List	Same	<ul style="list-style-type: none"> Added catalytic filter system dust bag loading operation (ID No. IS-DLO) Added 10,000 gallon ammonia storage tank (ID No. IS-AST) Revised MACT and GACT footnote
Permit page 1	Same	<ul style="list-style-type: none"> Revised dates, permit numbers, etc. using current shell standards
Global	Same	<ul style="list-style-type: none"> Revised all references to paragraphs and conditions to current permit shell standards.

Existing Condition No.	New Condition No.	Changes
Section 1. Permitted Emission Source Table	Same	<ul style="list-style-type: none"> Revised GF-1 descriptor <ul style="list-style-type: none"> Changed furnace capacity from 320 tpd nominal to 350 tpd rated glass pull rate Corrected heat input from 55 to 60 MMbtu/hr Removed “when firing gas language” – upon review the melter has the same production capacity when firing natural gas or propane Revised CD-1 descriptor to include PM control Revised GF-2 descriptor <ul style="list-style-type: none"> Removed “when firing gas language” – upon review the melter has the same production capacity when firing natural gas or propane Added “Subpart CC” descriptor to GF-1 and GF-2 ID Nos.
2.1.A. emission Source Table	Same	<ul style="list-style-type: none"> Revised GF-1 descriptor <ul style="list-style-type: none"> Changed furnace capacity from 320 tpd nominal to 350 tpd rated glass pull rate Corrected heat input from nominal 55 to maximum 60 MMbtu/hr Removed “when firing gas language” – upon review the melter has the same production capacity when firing natural gas or propane Revised CD-1 descriptor to include PM control
2.1.A (applicable regulations table)	Same	<ul style="list-style-type: none"> Removed reference to PSD Avoidance limitations. These limitations were removed from permit no. T21. Removed reference to permit application submittal requirement.
2.1 A.1	Same	2D .0515 condition
c.i(A)	Same	<ul style="list-style-type: none"> Revised condition to memorialize the allowable checker cleaning event interval Included mechanism to revise event interval without submitting a permit modification application consistent with current TV permitting procedures.
d.	Same	Added reference to NCGS 143-215.108
2.1 A.3	Same	The 2D .0524 NSPS Subpart CC was substantially revised to reflect the new emission limitations and associated monitoring, recordkeeping and reporting.
2.1 A.4.	Same	2D .0521 (visible emissions) condition
a.	Same	Added standard shell language addressing allowable exceedances
b.i and ii	b and c	Renumbered paragraphs to facilitate the added standard shell language addressing allowable exceedances
c.	NA	Removed 2D .0521(g) COMs requirements
d	c	Simple renumbering of test condition
e	NA	Removed COMS monitoring and recordkeeping requirements
f	i.iv.	Included the requirement into the revised condition h.iv.
g	j	Revised reporting requirements to reflect revised monitoring and recordkeeping requirements
NA	e.	Added the following statement for clarity. “No monitoring or recordkeeping requirements are required for the distributor and forehearths”
NA	f	Added VE requirements for the melter during normal operation
NA	g	Added VE requirements for the melter during control device bypass events
NA	h	Added VE requirements for the melter during checker cleaning events
NA	i	Added logbook requirements.
2.1 A.5	Same	MACT SSSSSS Condition

Existing Condition No.	New Condition No.	Changes
NA	2.1 A.5.f.	<ul style="list-style-type: none"> The following condition was added : If the Permittee, after issuance of Permit No. T26, conducts a performance test downstream of the control system (ID No. CD-1) in operation, the Permittee shall submit a permit application to revise the monitoring, recordkeeping and reporting requirements of Section 2.1 A.5.
f through l	f through n	<ul style="list-style-type: none"> Simple renumbering
2.1 A.6	NA	<ul style="list-style-type: none"> Removed application submittal requirement as this condition has been satisfied.
2.1 A.7	2.1.A.6.	<ul style="list-style-type: none"> Simple renumbering.
2.1 B emission Source Table	Same	<ul style="list-style-type: none"> Revised GF-2 descriptor <ul style="list-style-type: none"> Removed “when firing gas language” – upon review the melter has the same production capacity when firing natural gas or propane
2.1 B.3	Same	2D .0521 condition
d	e.	<ul style="list-style-type: none"> Highlighted no monitoring or recordkeeping requirements are required for the distributor and forehearth by including as a separate condition
NA	f	<ul style="list-style-type: none"> Included noncompliance statement as its own numbered paragraph.
e	g	<ul style="list-style-type: none"> Simple renumbering
2.1 B.4	Same	NSPS Subpart CC condition
d	same	<ul style="list-style-type: none"> Added reference to NCGS 143-215.108
e.	same	<ul style="list-style-type: none"> added mechanism to revise three-hour block average opacity limit without submitting a permit modification application consistent with current TV permitting procedures.
f.	same	<ul style="list-style-type: none"> added mechanism to revise 99% UCL value without submitting a permit modification application consistent with current TV permitting procedures.
2.1 C.2	Same	2D .0521 condition
c.	same	<ul style="list-style-type: none"> revised monitoring condition language to current shell standards. Changes include: <ul style="list-style-type: none"> adding language to correct above normal emissions “ as soon as practicable” added the following statement “The observation must be made for each quarter of the calendar year period to ensure compliance with this requirement”
2.2 A.2.	Same	Global Consent Decree imposed SO ₂ emissions limitation condition
Table 2.2.A.2.a.1.	Same	<ul style="list-style-type: none"> Revised Abnormally Low Production Rate Day Threshold for Furnace #1 (GF-1) from 112 to 123 tpd. Revised emission limit for GF-1 for clear glass from 640 to 700 lb/day and for colored glass from 768 to 840 lb/day.
Table 2.2.A.2.a.3.	Same	<ul style="list-style-type: none"> Revised emission limit for GF-1 for all glass from 2,400 to 2,625 lb/day
Table 2.2.A.2.a.4	Same	<ul style="list-style-type: none"> Revised emission limit for GF-1 for clear glass from $MH * 100 + NH * 27$ to $MH * 109 + NH * 29$ Revised emission limit for GF-1 for colored glass from $MH * 100 + NH * 32$ to $MH * 109 + NH * 35$
Table 2.2.A.2.a.5.	Same	<ul style="list-style-type: none"> Revised emission limit for GF-1 from 1,600 to 1,750 lb/day
Section 2.3	Same	Global Consent Decree condition
IV.7.m and n	Same	Removed these paragraphs. These two paragraphs were typographical errors that were inserted into Permit No. T25

Existing Condition No.	New Condition No.	Changes
NA	IV.8.m	Added GCD language that applies to sources combusting fuel oil at the request of the Permittee. The furnaces at this facility are currently not permitted to burn fuel oil.
IV.9.a.	Same	<ul style="list-style-type: none"> Added clarifying text to indicate which paragraphs of the Consent Decree have been satisfied by Henderson Furnace #1 (GF-1).
IV.10. Table 6	Same	<ul style="list-style-type: none"> Revised Abnormally Low Production Rate Day Threshold for Furnace #1 from 112 to 123 tpd. Added italicized language to memorialize this change
IV.13.a	same	<ul style="list-style-type: none"> Revised paragraph to include GCD language that applies to sources utilizing control devices
NA	IV.13.b	<ul style="list-style-type: none"> Added GCD language that applies to sources utilizing control devices
NA	IV.15.b	<ul style="list-style-type: none"> Added the following language found in the GCD that is now relevant to GF-1 since it installed a SCR "If [AGI] installs an SCR on any of the above facilities, then it will not have to install COMS on that Furnace".

VIII. Public Notice/EPA and Affected State(s) Review

(See chronology in Section II for actual dates)

A notice of the DRAFT Title V Permit will be made pursuant to 15A NCAC 02Q .0521. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Copies of the public notice will be sent (via email) to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 02Q .0522, a copy of each permit application, each proposed permit (via email) and each final permit shall be provided to EPA. Also pursuant to 02Q .0522, a notice of the DRAFT Title V Permit will be provided (via email) to each affected State at or before the time notice provided to the public under 02Q .0521 above. Pursuant to 15A NCAC 02Q .0518, the DAQ will not issue the final permit until EPA's 45-day review period has expired or until EPA has notified the Director that EPA will not object to issuance of the permit revision, whichever occurs first.

IX. Recommendations

~~It is recommended that permit no. 02834T26 be issued.~~